AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Original) A method of processing an input object for pattern recognition comprising the steps of:

receiving an input object;

segmenting a target object from the input object to form a segmented target object;

performing at least one transform on the segmented target object to generate at least one transformed object; and

outputting the segmented target object and the at least one transformed object to at least one pattern recognizer.

2. (Original) The method of claim 1, wherein:

the target object represents an image of a person's face.

3. (Original) The method of claim 1, wherein:

the target object represents a handwritten character.

4. (Original) The method of claim 1, wherein:

the target object represents a biometric.

5. (Original) The method of claim 1, wherein:

the transform is a rotation transform.

6. (Original) The method of claim 1, wherein:

the transform is a boundary shift transform.

7. (Original) The method of claim 1, wherein:

the transform is an affine transformation.

8. (Original) The method of claim 1, wherein the outputting step comprises:

outputting the segmented target object and the at least one transformed object to a single recognizer.

9. (Original) The method of claim 1, wherein the outputting step comprises:

outputting the segmented target object and the at least one transformed object to a plurality of complementary recognizers.

10. (Original) The method of claim 1, wherein the outputting step comprises:

outputting the segmented target object and the at least one transformed object to a plurality of substantially identically recognizers.

11. (Original) A method of processing an input object for pattern recognition comprising the steps of:

receiving an input object;

detecting a target object within the input object;

segmenting the target object from the input object to form a plurality of segmented target objects; and

outputting the segmented target objects to at least one pattern recognizer.

12. (Original) The method of claim 11, wherein the step of segmenting the target object from the input object to form a plurality of segmented target objects comprises:

modifying the target object.

13. (Original) The method of claim 12, wherein the step of segmenting at least one target object to form a plurality of segmented target objects comprises:

modifying a scale of the target object.

14. (Original) The method of claim 12, wherein the step of segmenting at least one target object to form a plurality of segmented target objects comprises:

shifting at least one boundary surrounding the target object.

15. (Original) The method of claim 12, wherein the step of segmenting at least one target object to form a plurality of segmented target objects comprises:

rotating the target object.

16. (Original) A method of aggregating a plurality of recognition results comprising the steps of:

receiving a segmented target object and at least one transform of the segmented target object;

performing at least one pattern recognition algorithm on the segmented target object and the at least one transform to generate a plurality of recognition results;

aggregating the plurality of recognition results to determine a recognition decision; and

outputting the recognition decision.

17. (Currently amended) The method of claim 16, wherein aggregating the plurality of recognition results is according to an equation:

$G_i(S_k(F_o(x)), ..., S_k(F_N(x))) = \max S_k(F_n[[,]](x))$ from 0 to N, wherein:

x denotes a segmented pattern in the segmented target object with N number of transforms performed, where n is $1 \leq n \leq N$;

k denotes a pattern class;

$F_N(x)$ denotes an extracted feature of an Nth transformed image, where $F_o(x)$ is an extracted feature of an original input pattern x;

$S_k(F_o(x))$ denotes a probability that $F_o(x)$ belongs to a class k; and

$G_i(S_k(F_o(x)), ..., S_k(F_N(x)))$ is an aggregation rule function indicating a possibility that $S_k(F_o(x)), ..., S_k(F_N(x))$ belongs to a class.

18. (Currently amended) The method of claim 16, wherein aggregating the plurality of recognition results is according to an equation:

$G_i(S_k(F_o(x)), ..., S_k(F_N(x))) = (1/N) \Sigma S_k(F_n(x))$ from n = 0 to N, wherein:

x denotes a segmented pattern in the segmented target object with N number of transforms performed, where n is $1 \leq n \leq N$;

k denotes a pattern class;

$F_N(x)$ denotes an extracted feature of an Nth transformed image, where $F_o(x)$ is an extracted feature of an original input pattern x;

$S_k(F_o(x))$ denotes a probability that $F_o(x)$ belongs to a class k; and

$G_i(S_k(F_o(x)), ..., S_k(F_N(x)))$ is an aggregation rule function indicating a possibility that $S_k(F_o(x)), ..., S_k(F_N(x))$ belongs to a class.

19. (Currently amended) The method according to claim 16, wherein determining the recognition decision is according to an equation:

$$D(x) = j, \text{ if } G_j(S_j(F_o(x)), ..., S_j(F_N(x))) = \arg\max_{1 \le k \le K} G_k(S_k(F_o(x)), ..., S_k(F_n(x))),$$

wherein:

D denotes a decision rule function;

G is an aggregation rule function;

x denotes a segmented pattern in the segmented target object with N number of transforms performed, where n is $1 \le n \le N$;

j denotes a matching object;

k denotes a pattern class;

$F_N(x)$ denotes an extracted feature of an Nth transformed image, where $F_o(x)$ is an extracted feature of an original input pattern x; and

$S_k(F_o(x))$ denotes a probability that $F_o(x)$ belongs to a class k.

20. (Original) The method of claim 16, wherein the performing step includes performing a plurality of complementary recognition algorithms.

21. (Original) The method of claim 16, wherein the performing step includes performing in parallel a plurality of substantially identical recognition algorithms.

22. (Original) A pattern recognition system comprising:

an input to receive an input object;

an object detector to detect a target object within the input object;

at least one transform module to perform at least one transform on the target object to form a plurality of transformed objects;

at least one pattern recognizer for generating a plurality of recognition results based on the target image and the plurality of transformed objects; and

a recognition result aggregator for determining a recognition decision based on the plurality of recognition results.

23. (Original) The system of claim 22, wherein:

the at least one transform module is a rotation transformer.

24. (Original) The system of claim 22, wherein:

the at least one transform module is a boundary shift transformer.

25. (Original) The system of claim 22, wherein:

a plurality of complementary pattern recognizers generate the plurality of recognition results.

26. (Original) The system of claim 22, wherein:

a plurality of substantially identical pattern recognizers operating in parallel generate the plurality of recognition results.

27. (Currently amended) The system of claim 22, wherein the recognition result aggregator aggregates the plurality of recognition results according to an equation:

$G_i(S_k(F_o(x)), ..., S_k(F_N(x))) = \max S_k(F_n(x))$ from 0 to N, wherein:

x denotes a segmented pattern in the segmented target object with N number of transforms performed, where n is $1 \leq n \leq N$;

k denotes a pattern class;

$F_N(x)$ denotes an extracted feature of an Nth transformed image, where $F_o(x)$ is an extracted feature of an original input pattern x;

$S_k(F_o(x))$ denotes a probability that $F_o(x)$ belongs to a class k; and

$G_i(S_k(F_o(x)), ..., S_k(F_N(x)))$ is an aggregation rule function indicating a possibility that $S_k(F_o(x)), ..., S_k(F_N(x))$ belongs to a class.

28. (Currently amended) The system of claim 22, wherein the recognition result aggregator aggregates the plurality of recognition results according to an equation:

$G_i(S_k(F_o(x)), ..., S_k(F_N(x))) = (1/N) \Sigma S_k(F_n(x))$ from n = 0 to N, wherein:

x denotes a segmented pattern in the segmented target object with N number of transforms performed, where n is $1 \leq n \leq N$;

k denotes a pattern class;

$F_N(x)$ denotes an extracted feature of an Nth transformed image, where $F_o(x)$ is an extracted feature of an original input pattern x;

$S_k(F_o(x))$ denotes a probability that $F_o(x)$ belongs to a class k; and

$G_i(S_k(F_o(x)), ..., S_k(F_N(x)))$ is an aggregation rule function indicating a possibility that $S_k(F_o(x)), ..., S_k(F_N(x))$ belongs to a class.

29. (Currently amended) The system of claim 22, wherein the recognition result aggregator determines the recognition decision according to an equation:

$$D(x) = j, \text{ if } G_j(S_j(F_o(x)), ..., S_j(F_N(x))) = \arg\max_{1 \le k \le K} G_k(S_k(F_o(x)), ..., S_k(F_n(x))),$$

wherein:

D denotes a decision rule function;

G is an aggregation rule function;

x denotes a segmented pattern in the segmented target object with N number of transforms performed, where n is $1 \le n \le N$;

j denotes a matching object;

k denotes a pattern class;

$F_N(x)$ denotes an extracted feature of an Nth transformed image, where $F_o(x)$ is an extracted feature of an original input pattern x; and

$S_k(F_o(x))$ denotes a probability that $F_o(x)$ belongs to a class k.

30. (Original) A pattern recognition system comprising:

an input to receive an input object;

an object detector to detect a target object and to form a plurality of segmented target objects;

at least one pattern recognizer for generating a plurality of recognition results based on the plurality of segmented target objects; and

a recognition result aggregator for determining a recognition decision based on the plurality of recognition results.

31. (Original) The system of claim 30, further comprising:

at least one transform module to perform at least one transform on the plurality of segmented target objects.

32. (Original) A pattern recognition apparatus comprising:

input means for receiving an input object;

transform means for performing at least one transform on the input object to generate at least one transformed object;

recognizer means for performing at least one pattern recognition algorithm on the input object and the at least one transformed object to generate a plurality of recognition results;

aggregating means for aggregating the plurality of recognition results to determine a recognition decision; and

decision output means for outputting the recognition decision.

33. (Currently amended) An apparatus for processing an input object for pattern recognition comprising:

input means for receiving an input object;

segmentation means for segmenting a target object from the input object to form a segmented target object;

transform means for performing at least one transform on the segmented target object to generate at least one transformed object; and

and output means for outputting the segmented target object and the at least one transformed object to at least one pattern recognizer.

34. (Original) An apparatus for processing an input object for pattern recognition comprising:

input means for receiving an input object;

segmentation means for segmenting at least one target object from the input object to form a plurality of segmented target objects; and

output means for outputting the segmented target objects to at least one pattern recognizer.

35. (Original) An apparatus for aggregating a plurality of recognition results comprising:

means for receiving a segmented target object and at least one transform of the segmented target object;

means for performing at least one pattern recognition algorithm on the segmented target object and the at least one transform of the segmented target object to generate a plurality of recognition results;

means for aggregating the plurality of recognition results to determine a recognition decision; and

means for outputting the recognition decision.

36. (New) The method of claim 11, wherein detecting the target object includes detecting the target object using a plurality of algorithms, and wherein segmenting the target object includes segmenting the target object to form, for each of the plurality of algorithms, a different segmented target object.

37. (New) The apparatus of claim 34, wherein the segmentation means includes means for segmenting the at least one target object from the input object to form, for each of a plurality of detection algorithms, a different segmented target object.